REMARKS

Applicants are amending the claims herein to correct typographical errors in the claims. These amendments are not narrowing amendments and are not in response to a patentability rejection.

Applicants will now address each of the Examiner's rejections in the order in which they appear in the Final Rejection.

Claim Rejections - 35 USC §103

Claims 1, 4, 8, 12, 16, 24, 53-56, 58-62 and 64

In the Final Rejection, the Examiner rejects Claims 1, 4, 8, 12, 16, 24, 53-56, 58-62 and 64 under 35 USC §103(a) as being unpatentable over Maekawa in view of Kusumoto et al. This rejection is respectfully traversed.

More specifically, in the initial Office Action, the Examiner contended that one having ordinary skill in the art would have been motivated to modify the process of Maekawa by performing laser annealing using the second harmonics of a YAG laser in place of an excimer laser because the second harmonic has a sufficient absorption coefficient to the amorphous semiconductor film and can crystallize the semiconductor film with a high degree of energy efficiency. In response in Amendment A, Applicants disagreed with this contention of the Examiner in Amendment A and respectfully submitted that there is no disclosure in either Maekawa or Kusumoto that the second harmonic has a sufficient absorption coefficient to the amphorous semiconductor and can crystallize the semiconductor film with a high degree of energy efficiently. Applicants then respectfully

submitted that there is no motivation or suggestion to combine the references, in the manner proposed by the Examiner.

In response in the Final Rejection, the Examiner now contends that the motivation to combine these references is that both an excimer laser and a second harmonic YAG laser are art-recognized equivalents used in photo-annealing methods to crystallize amorphous silicon and cites col. 2, lns. 50-59 in Kusumoto in support thereof.

However, col. 2, lns. 50-59 (and particularly lns. 54-59) in Kusumoto merely state that various excimer lasers such as a KrF excimer laser..., and a Nd:YAG laser... and a second harmonic component (wavelength of 532 nm)... may be used. This single sentence in Kusumoto does not mean that the two types of laser beams are art-recognized equivalents.

Further, Kusumoto does not teach or suggest crystallization of semiconductor film using two steps of heat treatment and laser annealing along with the application of the several types of laser beams, as in the claimed invention.

Furthermore, even if arguably the two types of laser annealing were equivalent (a position which Applicants do not agree) in one step of crystallization of the semiconductor film by laser annealing, as shown in Kusumoto, this is not true when performing the laser annealing after partial crystallization (i.e. two steps of crystallization), as in the claimed invention. In particular, a laser beam having a wavelength from 360 nm to 650 nm can efficiently crystallize the structure remaining of the continuous crystalline region in a partially crystallized semiconductor film which has been crystallized by heat treatment (see e.g. page 19, lns. 8-12 of the present application). In such a case, the continuous crystalline region is useful due to its possibility of obtaining a TFT with high electric characteristics (see e.g. page 18, lns. 14-16 of the present application), while the laser annealing using an excimer laser makes the partially crystallized semiconductor obtained by the heat treatment

melt so that the unclear grain boundaries of the crystalline grains formed by the heat treatment are eliminated. Hence, the alleged motivation provided by the Examiner in the Final Rejection is not technically correct or proper since an excimer laser and a second harmonic component of Nd: YAG laser are not equivalent in laser annealing after partially crystallization of semiconductor film.

Additionally, even if there were arguably a motivation to combine Maekawa and Kusumoto (a position which Applicants do not agree), one skilled in the art would not upon reading these reference realize the remarkable effect achieved with the claimed invention which is not merely an optimization, from a laser beam having a wavelength from 360 nm to 650 nm, compared to prior art on crystallizing amorphous regions in partially crystallized semiconductor film. Hence, one skilled in the art would not be lead to the claimed invention, or the remarkable effect achieved by the claimed invention, by combining Maekawa and Kusumoto. As a result, the combination of these references to arrive at the claimed invention could only be by hindsight reconstruction which is improper.

Applicants also submit that even if combined, none of the cited references or combination thereof teach or suggest the claimed feature of "to form a second semiconductor film in which crystal regions and amorphous regions are intermingled" as recited in independent Claims 1 and 53. Applicants have also added this patentable feature to independent Claims 4 and 59.

Furthermore, Applicants have added the feature of performing a laser annealing "in order for the crystal regions generated by the heat treatment to remain and for annealing mainly the amorphous regions" to independent Claims 1, 4, 53 and 59. This feature is supported, for example, by page 18, line 21 to page 19, line 13 of the specification of the present application. This feature is also not disclosed or suggested by any of the cited references.

Therefore, for at least the above-stated reasons, it is respectfully submitted that the combination of references in this rejection is improper, and even if combined, the claims are patentable over the cited references. Accordingly, it is respectfully requested that this rejection be withdrawn.

Claims 20, 57 and 63

The Examiner also rejects Claims 20, 57 and 63 under 35 USC §103(a) as being unpatentable over Maekawa in view of Kusumoto et al. and further in view of Ohtani et al. This rejection is also respectfully traversed.

For at least the reasons discussed above, these claims are also patentable over the cited references. Accordingly, it is requested that this rejection be withdrawn.

Information Disclosure Statement

Applicants are also submitting an information disclosure statement (IDS) herewith. It is respectfully requested that this IDS be entered and considered prior to the issuance of any further action on this application.

Applicants also note that in the Advisory Action, the Examiner states that the IDS filed on July 30, 2004 has not been considered. Upon further review, Applicants realize that this IDS had already been submitted on June 3, 2003 and has already considered by the Examiner. Hence, the July 30, 2004 IDS is redundant.

Conclusion

Applicants respectfully submit that the present application is in a condition for allowance and should be allowed.

If any fee is due for this amendment, please charge our deposit account 50/1039.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

Mark J. Murphy
Registration No. 34,225

COOK, ALEX, McFARRON, MANZO,
CUMMINGS & MEHLER, Ltd.
200 West Adams Street, Suite 2850
Chicago, Illinois 60606
(312) 236-8500